REPORT DOCUMENTATION PAGE

WR-129-93

Form Approved
OMB No. 0704-0188

1. AG...	E	3. REPORT TYPE AND DATES COVERED

4. TITL...
Dental Utilization by Active Duty Army Personnel

5. FUNDING NUMBERS

6. AUTHOR(S)
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7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
U.S. Army Institute of Dental Research
Washington, D.C. 20307-5300

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
U.S. Army Medical Research & Development Command
Ft. Detrick, Frederick, MD 21702-5012

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT
APPROVED FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED

12b. DISTRIBUTION CODE

13. ABSTRACT (*Maximum 200 words*)

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14. SUBJECT TERMS dental utilization, active duty soldiers, mix of dental services consumed			15. NUMBER OF PAGES 16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT

MILITARY MEDICINE, 158, 10:670, 1993

Dental Utilization by Active Duty Army Personnel

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In spring 1989, a random, Army-wide sample of 15,364 enlisted and 4,529 officer personnel was surveyed on dental utilization. Results show no difference in annual dental utilization between officer and enlisted personnel when age is controlled. Because annual dental utilization increases with age and enlisted ranks contain a disproportionately large number of younger personnel, a difference in annual dental utilization between enlisted and officer personnel emerges when age is not controlled. Check-ups are the most common reason for dental visits. Nearly all soldiers seek care exclusively in military dental clinics. Non-use is highest among 18- to 19-year-olds (12.2%).

Introduction

The Army Health Promotion Program (AHPP) seeks "to maximize readiness, combat efficiency, and work performance" of active duty soldiers by promoting preventive medicine.[1] Consistent with this mission, the dental component of the AHPP—the Oral Health Fitness Program (OHFP)—aims "to ensure that soldiers do not become 'noncombat dental casualties' "[2] by requiring that every active duty soldier receive an annual dental examination.[1]

The association of routine dental examinations with reducing noncombat dental casualties among deployed troops has been well documented.[3-5] Reports from Vietnam claim that dental emergency rates were cut in half (from 142 to 72 per 1,000 men) after dental screening exams and referral for treatment of potential dental emergencies became part of in-processing.[3] In a later case-control study, dental sick call patients from an Army field training exercise were matched with non-sick call controls randomly chosen from the same unit. It was found that 29% of cases had complied with the annual dental examination requirement versus 45% of controls.[4] In a more recent study of a deployed contingent of 600 soldiers to the Sinai Peninsula, Egypt, the dental sick call rate was lower than that observed in similar studies of deployed personnel. The authors attributed this to an intensive predeployment effort to improve the dental health of the troops being deployed.[5]

Preventing unexpected oral and dental emergencies from occurring during military operations can save time lost to mission-essential duties by combatants. Reports from field commanders in Vietnam indicated that "combat effectiveness was being disrupted by dental emergencies which incapacitated key men for as long as 7 days".[3] Using data from two field exercises, Payne and Posey estimated lost time to duty from dental emergencies totaled 121.5 days per 1,000 troops per year.[6]

The results of these earlier studies demonstrate the potential benefits of a dental examination requirement in the military environment. However, preventive measures such as required annual dental exams are effective only if practiced. To date, no study has ever explored dental utilization among a random, representative sample of active duty military personnel. Results from the case-control study mentioned above[4] were limited to a deployed unit and could not be generalized to the Army at large. The purpose of this study is to determine the

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The views of the author do not purport to reflect the views of the Department of the Army or the Department of Defense (para. 4-3, AR 360-5).

This manuscript was received for review in January 1993 and was accepted for publication in February 1993.

extent to which active duty soldiers comply with the requirement to undergo an annual dental examination, where they seek dental care, and the main reason (type of care sought) and nature (emergency versus routine) of their last dental visit.

Methods

This study collected data on dental utilization by active duty Army personnel on the spring 1989 Sample Survey of Military Personnel (SSMP). The SSMP is administered by the Army Personnel Survey Office, U.S. Army Research Institute for the Behavioral and Social Sciences (ARI). Semi-annually, Army-wide, random, representative samples are selected using the last two digits of Social Security numbers from the Standard Installation/Division Personnel System. The sample targets 10% of officers and 5% of enlisted personnel.

For the spring 1989 survey, 15,364 enlisted and 4,529 officer personnel returned survey questionnaires, giving a 46.7% and a 42.3% response rate, respectively. Response rate for individual questions may vary due to nonresponse.

The dental utilization questions included on the 170-item questionnaire are given in Table I. The wording of questions 1 and 2 are identical to those used on national surveys of dental utilization by the National Institute of Dental Research.[7] This was done so that valid comparisons could be made between the active duty population and their civilian cohorts. The questionnaire also collected extensive demographic data which were used to explore differences in utilization across age, gender, and rank subgroup.

The data were analyzed on a mainframe computer by ARI personnel using the Statistical Package for the Social Sciences.

TABLE I

DENTAL UTILIZATION QUESTIONS ON SPRING 1989 SURVEY OF ACTIVE DUTY ARMY PERSONNEL

1. How long has it been since your last visit for dental care?
   a. Does not apply: I have never received dental care
   b. Less than 1 year
   c. 1–2 years
   d. 3–4 years
   e. 5 or more years
2. What was the main reason for your *most recent* visit for dental care?
   a. Does not apply: I have never received dental care
   b. Regular check-up/teeth cleaning
   c. Tooth filled/repair broken tooth
   d. Tooth pulled or other surgery/toothache
   e. Bleeding gums or periodontal disease
   f. Other
3. Was your *most recent* dental visit for emergency or routine dental treatment?
   a. Does not apply: I have never received dental care
   b. Routine appointment
   c. Emergency visit
4. Where do you go for dental care?
   a. Does not apply: I have never received dental care
   b. Military dental clinic only
   c. Civilian dental clinic only
   d. Both military and civilian dental clinics

TABLE II

INTERVAL SINCE LAST DENTAL VISIT BY RANK SUBGROUP

Rank Subgroup	< 1 Year	1–2 Years	3+ Years	Never
PV1–SPC				
n = 8,311	67.5 ± 1.0%	21.2 ± 0.9%	3.9 ± 0.4%	7.4 ± 0.6%
SGT–SSG				
n = 4,942	69.7 ± 1.3%	23.4 ± 1.2%	3.5 ± 0.5%	3.4 ± 0.5%
SFC–SGM				
n = 1,787	71.4 ± 2.1%	22.1 ± 1.9%	4.4 ± 1.0%	2.1 ± 0.7%
All Enlisted				
n = 15,040	68.6 ± 0.7%	22.0 ± 0.7%	3.8 ± 0.3%	5.6 ± 0.4%
W1–W4				
n = 518	75.4 ± 3.7%	20.9 ± 3.5%	2.6 ± 1.4%	1.0 ± 0.9%
2LT–CPT				
n = 2,479	72.3 ± 1.8%	22.1 ± 1.6%	3.1 ± 0.7%	2.5 ± 0.6%
MAJ and above				
n = 1,467	78.4 ± 2.1%	18.1 ± 2.0%	2.5 ± 0.8%	1.0 ± 0.5%
All officers				
n = 4,464	74.6 ± 1.3%	20.7 ± 1.2%	2.8 ± 0.5%	1.8 ± 0.4%

Results are presented as point estimates with standard errors at the 95% confidence level. For questions 2, 3, and 4, all "Does not apply" responses were deleted. Question 1 results were stratified by age bands similar to those used in national surveys. Age groups (under 18 and over 50) with too few observations to give a stable point estimate were excluded.

Results

Table II shows that two-thirds or more of Army enlisted personnel and nearly three-quarters of Army officers have seen a dentist within the past year. The difference between the two groups is driven by the relatively low annual dental utilization by PV1–SPCs (67.5%) and the relatively high annual dental utilization by majors and above (78.4%). For other rank subgroups, the 95% confidence intervals overlap, indicating no difference in annual dental utilization.

A greater proportion of enlisted personnel (5.6%) than officers (1.8%) have never seen a dentist. The proportion of never users is inversely related to rank.

In Table III, dental utilization rates across age, gender, and rank group are given. Within each rank group, annual dental utilization shows a direct relationship with age; yet within any given age group, there is no difference in annual dental utilization between rank groups. Non-use of dental care shows a strong inverse relationship with age within both rank groups. However, within a given age group, non-use does not differ between officer and enlisted personnel. The high non-use of dental care by 18- to 19-year-olds (12.2%) is particularly striking. Annual dental utilization is greater and non-use of dental care is less for female than male enlisted personnel, but no gender difference exists for these measures for officer personnel.

Regarding main reason for last dental visit (Table IV), the leading reason given by all ranks was a dental check-up. Officers (71.5%) were more likely than enlisted personnel (61.8%)

TABLE III

INTERVAL SINCE LAST DENTAL VISIT BY AGE AND GENDER WITHIN RANK GROUP

			Interval for Rank Group							
			< 1 Year		1–2 Years		3+ Years		Never	
Age	Enl *n*	Off *n*	Enl	Off	Enl	Off	Enl	Off	Enl	Off
18–19	1,259	–	64.8 ± 2.6%	–	18.4 ± 2.1%	–	2.3 ± 0.8%	–	12.2 ± 1.8%	–
20–24	5,765	396	67.7 ± 1.2%	66.6 ± 4.6%	22.0 ± 1.1%	25.9 ± 4.3%	2.4 ± 0.4%	2.6 ± 1.6%	6.5 ± 0.6%	3.9 ± 1.9%
25–29	3,357	1,064	69.9 ± 1.6%	73.5 ± 2.7%	22.9 ± 1.4%	21.3 ± 2.5%	2.5 ± 0.5%	2.1 ± 0.9%	3.7 ± 0.6%	2.4 ± 0.9%
30–34	2,191	1,025	70.7 ± 1.9%	74.5 ± 2.7%	22.9 ± 1.8%	21.3 ± 2.5%	2.7 ± 0.7%	2.5 ± 0.9%	2.7 ± 0.7%	1.3 ± 0.7%
35–39	1,391	848	71.6 ± 2.4%	75.3 ± 2.9%	21.7 ± 2.2%	20.8 ± 2.7%	3.0 ± 0.9%	1.9 ± 0.9%	2.2 ± 0.8%	1.2 ± 0.7%
40–44	563	702	72.7 ± 3.7%	77.7 ± 3.1%	21.4 ± 3.4%	19.1 ± 2.9%	2.7 ± 1.3%	1.0 ± 0.7%	2.4 ± 1.3%	0.9 ± 0.7%
45–49	119	271	74.9 ± 7.8%	81.6 ± 4.6%	21.9 ± 7.4%	13.3 ± 4.0%	0%	3.1 ± 2.1%	0.8 ± 1.6%	0.5 ± 0.8%
Gender			Within 12 Months		1–2 Years		3+ Years		Never	
Male	13,071	396	67.9 ± 0.8%	74.3 ± 4.3%	22.3 ± 0.7%	21.2 ± 4.0%	3.9 ± 0.3%	2.8 ± 1.6%	1.6 ± 1.2%	5.8 ± 0.4%
Female	1,961	565	74.0 ± 1.9%	76.8 ± 3.5%	19.8 ± 1.8%	17.0 ± 3.1%	2.6 ± 0.7%	2.9 ± 1.4%	3.2 ± 1.5%	3.6 ± 0.8%
Total	15,040	4,469	68.6 ± 0.7%	74.6 ± 1.3%	22.0 ± 0.7%	20.7 ± 1.2%	3.8 ± 0.3%	2.8 ± 0.5%	1.8 ± 0.4%	5.6 ± 0.4%

TABLE IV

MAIN REASON FOR LAST DENTAL VISIT BY RANK SUBGROUP

		Reason For Dental Care				
Rank Subgroup	*n*	Check-Up	Fillings	Extraction	Bleeding Gums	Other
PV1–SPC	7,664	57.7 ± 1.1%	21.2 ± 0.9%	14.2 ± 0.8%	1.1 ± 0.2%	5.8 ± 0.5%
SGT–SSG	4,776	67.2 ± 1.3%	18.3 ± 1.1%	7.9 ± 0.8%	1.8 ± 0.4%	4.9 ± 0.6%
SFC–SGM	1,761	67.4 ± 2.2%	17.7 ± 1.8%	7.2 ± 1.2%	2.8 ± 0.8%	4.9 ± 1.0%
All enlisted	14,201	61.8 ± 0.8%	19.9 ± 0.7%	11.4 ± 0.5%	1.5 ± 0.2%	5.4 ± 0.2%
W01–W04	516	71.1 ± 3.9%	19.7 ± 3.4%	3.2 ± 1.5%	1.1 ± 0.9%	4.8 ± 1.8%
2LT–CPT	2,412	72.2 ± 1.8%	16.1 ± 1.5%	6.6 ± 1.0%	0.8 ± 0.4%	4.3 ± 0.8%
MAJ and above	1,459	70.4 ± 2.3%	20.0 ± 2.0%	3.9 ± 1.0%	2.3 ± 0.8%	3.4 ± 0.9%
All officers	4,387	71.5 ± 1.3%	17.8 ± 1.1%	5.3 ± 0.7%	1.3 ± 0.3%	4.1 ± 0.6%

to have visited the dentist for this purpose. The converse is true for extractions.

Officers (92.0%) were slightly more likely than enlisted personnel (87.0%) to characterize their last dental visit as routine rather than as an emergency (Table V). Emergency visits were more common among junior personnel (PV1–SPC) in the enlisted ranks but more common among senior personnel (majors and above) in the officer ranks. Nearly all Army personnel sought dental care in military dental clinics only (Table VI).

TABLE V

URE OF MOST RECENT DENTAL VISIT BY RANK SUBGROUP

		Nature of Dental Visit	
Rank Subgroup	*n*	Routine	Emergency
PV1–SPC	7,311	85.0 ± 0.8%	15.0 ± 0.8%
SGT–SSG	4,666	89.2 ± 0.9%	10.8 ± 0.9%
SFC–SGM	1,729	90.1 ± 1.4%	9.9 ± 1.4%
All enlisted	13,706	87.0 ± 0.6%	13.0 ± 0.6%
W01–W04	509	92.1 ± 2.3%	7.9 ± 2.3%
2LT–CPT	2,365	92.8 ± 1.0%	7.2 ± 1.0%
MAJ and above	1,449	90.6 ± 1.5%	9.4 ± 1.5%
All officers	4,323	92.0 ± 0.8%	8.0 ± 0.8%

Discussion and Conclusion

A major finding from this study is that over two-thirds of enlisted personnel and three-quarters of officers have visited a dentist within the past year. Over 90% of all Army personnel have seen a dentist within the past 2 years.

At first glance, these results suggest high compliance with the Army Oral Health Fitness Program. However, annual dental utilization rates include all types of visits, not just annual exams. Therefore, this measure overstates compliance with the OHFP.

Closer to measuring compliance are the figures in Table IV, which give the main reason for last dental visit (check-up). However, because response to this question was not limited to those who had seen a dentist within the past year, these figures also overstate compliance with the OHFP. Thus, the best we can say is that at most 61.8% of enlisted personnel and 71.5% of officers complied with the annual dental examination requirement expressed in Army regulations.[1,2]

These findings raise several concerns regarding dental readiness. First, compliance with the annual dental examination requirement of the OHFP is far from 100%. That 40% of enlisted personnel and 30% of officers are not receiving annual dental exams may have an adverse impact on dental readiness.

TABLE VI

SOURCE OF DENTAL CARE BY RANK SUBGROUP

Rank Subgroup	n	Source of Dental Care		
		Military Only	Civilian Only	Both Military and Civilian
PV1-SPC	7,795	86.3 ± 0.8%	5.2 ± 0.5%	8.5 ± 0.6%
SGT-SSG	4,816	92.9 ± 0.7%	2.7 ± 0.5%	4.5 ± 0.6%
SFC-SGM	1,771	91.7 ± 1.3%	2.8 ± 0.8%	5.5 ± 1.1%
All enlisted	14,382	89.0 ± 0.5%	4.1 ± 0.3%	6.9 ± 0.4%
W01-W04	516	92.6 ± 2.3%	1.1 ± 0.9%	6.3 ± 2.1%
2LT-CPT	2,433	89.5 ± 1.2%	2.5 ± 0.6%	8.0 ± 1.1%
MAJ and above	1,456	92.4 ± 1.4%	2.4 ± 0.8%	5.2 ± 1.1%
All officers	4,405	90.8 ± 0.9%	2.3 ± 0.4%	6.9 ± 0.7%

However, without concurrent oral health measures on the sample, it is impossible to determine whether such an association exists. Second, we cannot say what proportion of those who had examinations and were found to have dental problems pursued corrective care. Third, it is very likely that the 10% of the sample who have not seen a denstist within 3 or more years would be problematic to dental readiness because most dental caries occurs in a relatively small number of people. According to the most recent national survey of children, of all carious teeth, 50% were in 12% of children and over 75% were in 24% of children.[8] Finally, non-users of dental care could create difficulties in post-mortem identification because they will not have dental panographic radiographs on file. The particularly high non-use rates among 18- to 24-year-olds suggests that a special effort should be made to target these groups for annual dental examinations and follow-up care to improve dental readiness. This is a prime age group for unerupted third molars which may be potential dental emergencies if left untreated.

Another major finding from this study comes from stratifying the data across age and rank. Since there is no difference in annual dental utilization between rank groups when age is controlled, the difference observed between rank groups when age is not controlled is merely an artifact of the different age composition of the two rank groups. Simply put, enlisted personnel have a lower annual dental utilization rate than officers because younger age groups in this sample are less likely to make an annual dental visit than older age groups, and enlisted ranks contain a disproportionately larger number of younger age groups than officer ranks. Age confounds the effect of rank.

A final major finding is that a clear majority of Army personnel are using the dental care system. Very few elect to pursue civilian dental care. Since the SSMP goes to all Army personnel regardless of assignment location, it is likely that the sample included soldiers who do not have convenient access to military dental clinics (for example, recruiters). The almost exclusive use of military clinics for dental care suggests that soldiers have a high degree of confidence in the Army dental care system.

A major limitation of this study is that it does not compare dental utilization behavior of active duty soldiers with their civilian cohorts. To do this, the results would need to be stratified simultaneously by age, gender, and race. All these data elements were collected and such a comparison was an original study objective. However, due to a bad sector on the data tape, it was impossible to determine the race of respondents, so this analysis had to be abandoned.

In conclusion, it is recommended that, just as in the national population, dental utilization surveys of the military population should be done periodically to follow trends and to establish targets for improving the oral health of soldiers. A major Tri-Service effort is underway to conduct a comprehensive oral health survey of soldiers, sailors, and airmen in 1993. In addition to assessing dental utilization, the Tri-Service study proposes to collect data on dental treatment requirements and dental readiness status so that the association between these two variables can be explored. The mix of dental services consumed in the past year will also be determined so that the question of follow-up care can be answered.

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